

Claims

What is claimed is:

1. Apparatus for remotely monitoring and controlling water parameters in a water installation, the apparatus comprising:

5 at least one sensor for monitoring a water installation parameter, said sensor being in dynamic communication with the water installation;

 an electronic data acquisition system for receiving data obtained by said sensor ;

 a remote data collection and storage server for remotely communicating with the electronic data acquisition device; and

10 a network interface for providing a network connection between the remote data collection and storage server and the electronic data acquisition device.

2. The apparatus of Claim 1, wherein the water installation includes at least one of a swimming pool and a spa.

3. The apparatus of Claim 1, including a plurality of sensors, with one of said
15 sensors being selected from the group of a water temperature sensor, a water pH sensor, an ORP sensor, and an ozone status sensor.

4. The apparatus of Claim 1, further including a remote user interface from which a user may monitor data collected by said sensor and may send commands to said electronic data acquisition device to affect said controlled parameter.

5. The apparatus of Claim 1, wherein the water installation includes a pump for recirculating water and a heater for heating water in said at least one of a pool and a spa, said apparatus further including a pump status sensor and a heater status sensor.

6. The apparatus of Claim 1, wherein the water installation further includes a water filter, and said sensor is a filter status sensor.

7. The apparatus of Claim 1, including a plurality of said sensors.

8. The apparatus of Claim 1, including means for automatically calculating and optionally displaying chemical information for achieving desired chemical water balance.

9. The apparatus of Claim 1, further comprising means for electronically forwarding information related to said sensor data to a remote user at a remote user interface.

10. The apparatus of Claim 1, including communication means for forwarding selected information to at least one of a chemical supplier and pool/spa maintenance personnel.

11. The apparatus of Claim 9 or Claim 10, in which said means for electronically forwarding information includes at least one of the group of e-mail and pager.

12. The apparatus of Claim 1, further comprising means for remotely viewing a current operational state of the water installation.

13. The apparatus of Claim 1, further comprising means for remotely viewing stored data on the remote data collection and storage server, said data is in the form of at least one of a graph, chart, and table.

14. The apparatus of Claim 1, further comprising means for automatically forwarding an electronic notice or error message to a specified recipient under predetermined circumstances, including response to occurrence of a specified stimulus or event.

5 15. The apparatus of Claim 14, wherein the notice or message includes an electronic mail or page.

16. The apparatus of Claim 4, further including an electronic controller and a controller interface for interfacing between said data acquisition system and said electronic controller, said interface providing said remote control of said electronic controller.

10 17. The apparatus of Claim 1, said network interface providing a network connection between said remote server and said data acquisition system to pass commands to said data acquisition system to control the water installation.

15 18. The apparatus of Claim 17, wherein said aspects of the water installation that are controlled include at least one of the group of a pump for circulating water in the water installation, a heater for heating water in the water installation, and a valve for controlling water flow.

19. Apparatus for remotely monitoring and controlling water parameters in a water installation, comprising:

a plurality of sensors for monitoring a plurality of water installation parameters;

an electronic data acquisition and control device in electrical communication with said sensors for receiving data signals indicative of the monitored water parameters and for selectively generating control signals to control devices related to said parameters;

a remote server; and

5 a network interface for providing a network connection between said remote server and said data acquisition and control system said interface including means for transmitting data to said remote server for collection and storage on said server, and for transmitting commands to said data acquisition and control system for controlling said related devices.

10 20. The apparatus of Claim 19, further comprising means for remotely viewing a current operational state of the water installation.

21. The apparatus of Claim 19, further comprising means for remotely viewing the data stored on the remote data collection and storage server in the form of a graph, chart, or table.

15 22. A method for remotely monitoring and controlling water parameters for a water installation, said method comprising:

periodically collecting water data indicating the state of water parameters at a local collection system;

providing a data communication link between the local system and a remote server on a predetermined schedule or upon demand;

20 transmitting the water data from the local system to the remote server for storage and processing at the remote server; and

accessing the remote server to access the water parameter data.

23. The method of Claim 22, wherein the step of providing a data communication link comprises establishing a dial-up connection between the local system and the remote server over a telephone line.

5 24. The method of Claim 22, wherein the step of providing a data communication link comprises establishing an Internet connection between the local system and the remote server.

10 25. The method of Claim 22, wherein the step of providing a data communication link comprises establishing a wireless communications interface between the local system and the remote server.

15 26. The method of Claim 22, further including providing at least one electrically-controllable device, and transmitting control commands from the remote server to an electronic controller to remotely control said at least one electrically-controllable device.

20 27. The method of Claim 26 wherein the water installation is a pool or a spa, the at least one electrically-controllable device includes a water pump for circulating water in the pool or spa and a water heater for heating water in the pool or spa, and the control commands are for remotely controlling the pump and the heater.

 28. The method of Claim 22, further comprising remotely accessing the remote server to view a current operational state of the water installation.

25 29. The method of Claim 22, further comprising remotely viewing the data stored on the remote data collection and storage system in the form of a graph, chart, or table.

30. A method for remotely monitoring and controlling water parameters of a pool or a spa, said method comprising:

periodically collecting water parameter data at a local collection system;

providing a data communication link between the local collection system and a

5 remote server on a predetermined schedule or upon demand;

transmitting the water parameter data over said data communication link from said local collection system to the remote server for storage and processing at the remote server;

accessing the remote server to access the water parameter data; and

transmitting control commands from the remote server to the local system to affect

10 said parameters.

31. The method of Claim 30, further including accessing the remote server by use of an Internet browser.

32. The method of Claim 30, further comprising remotely accessing the remote server to view a current operational state of the water installation.

15 33. The method of Claim 30, further comprising remotely viewing the data stored on the remote server in the form of a graph, chart, or table.

34. Apparatus for monitoring spa parameters, including:

at least one sensor for detecting the state of a selected spa parameter;

means for communicating said state to a network server;

20 means for viewing said communicated state from said network server.

35. The apparatus of Claim 34, including means for storing a series of said state information.

36. The apparatus of Claim 35, in which said means for viewing includes means for displaying said series of states graphically.

5 37. The apparatus of Claim 36, in which said means for viewing includes an Internet browser.

38. The apparatus of Claim 34, including means for transmitting commands from said means for viewing to said network server, and further including means for communicating said commands to control means for equipment at said spa, said control
10 means and its associated equipment acting in response to said commands to affect future states of said selected parameters.

39. A method of controlling pool water parameters over the Internet, including:
providing means to monitor said parameters at said pool;
transmitting said parameters to a server connected to the Internet;
15 storing said parameters on said server;
viewing said parameter information stored on said server;
transmitting a command to said server in response to said viewing;
transmitting said command from said server to controlled equipment at said pool to
cause said equipment to take a desired action affecting said parameter.